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THE MOTOR AGE

THE AUTOMOBILE AUTHORITY OF AMERICA

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SOCIETY RACES AT NEWPORT

W. K. VANDERBILT, JR., WITH HIS BIG GERMAN DAIMLER RACING MACHINE CARRIED OFF THE CHIEF HONORS AND MADE THE BEST TIME—RACES FOR ALL CLASSES OF VEHICLES—SOCIETY OUT IN FORCE

New York, Sept. 6.—Seven thousand spectators saw the automobile races at the old Acquidneck Park half-mile track this afternoon. Thirteen trial heats and finals, embracing practically all classes of vehicles and motors, and including a championship race for the winners of all classes, were run with such success as the inadequate track permitted.

Fashion set its seal of approval on motor vehicle racing and the public accepted it, just as it did when "Johnny" Van Alen started the bicycle boom with his famous cycle parade early in the nineties. Automobile racing will now be the fad—anyhow, until the motor-vehicle reaches perfection and is accepted as a matter of course. The elements of inventive rivalry and unapproachable speed may even extend auto-

racing beyond this time and make it the sport par excellence on land. And why not? It needs no very vivid imagination to create the factors of its success in the future. Your auto-sport of the near future may have his racing stable of mile-a-minute flyers as well as his automobile road machines.

Inspired by Vanderbilt

At the bottom of all this boom is without doubt William K. Vanderbilt, Jr. It was the much-exploited feats of his imported racing car on the road that aroused in him an ambition for competitive tests on a measured course.

So it was that the National Automobile Racing Association was formed with him as president, Spencer C. Crane and F. W. Peckham as vice-presidents, and George F. Baright as secretary and general manager. The promotion of today's meet was an easy and prompt outcome.

Fashion and the trade at once joined hands to make the affair a success. Both were generous, as the list of the donors of the prizes will show: Cup for steam class, W. K. Vanderbilt, Jr.; cup for gasolene class, New England Electric Vehicle & Transportation Co.; cup for electric class, Locomobile Co. of America; cup for tricycle class, Mrs. O. H. P. Belmont; and cup for mixed championship class, Mrs. Herman Oelrichs. The club awarded cups to the seconds in all the classes.

Vanderbilt's Fast Time

Mr. Vanderbilt "made good" in astonishing fashion with his good German racing Daimler, about which so much has been written. He geared it down, fearing to risk the constant sharp curve of the track with a high gear. His car, his skill in handling it, and the speed he attained on this miserable little track, all brought him credit and added to his well-earned popularity as promoter of the meet. In fact, he scored a success that is sure to mean much for automobile racing in this country.

Mr. Bostwick had prophesied that the big racing machines "couldn't go a little bit" on such a track, and declined to meet Mr. Vanderbilt there with his world's record holding De Knyff Panhard. It now remains for Mr. Bostwick to meet Mr. Vanderbilt on one of the tracks at Chicago, Guttenburg or Trenton—on which big automobile races are scheduled in the near future. But Mr. Bostwick will be there, never fear, for he has sporting blood and racing enthusiasm. He is even now breaking in his Panhard on the road and has mixed up as an adviser in the coming big meets to an extent that shows he means to be at them ready to meet all comers.

The races were all at five miles. The results follow:

Electric Vehicles

First heat: Mrs. Herman Oelrichs won by default, C. W. Dolan's car being unable to face the starter.

Second heat: A. L. Riker, first, 10:44; S. C. Crane, second, 10:52½. L. H. De Forest also ran. Mr. De Forest's machine, piloted by a professional, was distanced in the first half-mile, leaving the race to Messrs. Riker and Crane. The former secured the pole at the start and held it throughout. The two machines made a beautiful battle of it for four miles, racing side by side. In the next mile Mr. Riker drew ten feet ahead and finally won by thirty yards.

Final heat: A. L. Riker, first, 13.05; Mrs. Herman Oelrichs (Stuyvesant Leroy, driver) did not finish. Mr. Riker set such a pace that he forced his opponent to quit, and won easily.

Motor Tricycles

First heat: Kenneth A. Skinner, first, 10:30½; J. Boiselote, second, 11:40; Harold S. Vanderbilt also ran, not timed. Young Vanderbilt's tricycle, ridden by a professional, was soon distanced. Skinner, on his De Dion, had no trouble in running away from his competitor.

Second heat: C. S. Henshaw's understudy, first, 9:52; Royal Phelps Carroll did not finish. Mr. Carroll's tricycle acted badly, and he soon quit.

Final heat: Skinner, first, 9:12; Henshaw's understudy did not finish. It

was a one-sided contest between riders for the same make.

Steam Vehicles

First heat: S. T. Davis, first, 10.45½; Col. John Jacob Astor, not timed. Both drove Locomobiles. Mr. Davis' American twenty-five-mile record-holding car was far too fast for Col. Astor's road vehicle. The Colonel kept within twenty feet of the record-holder for a half a mile. Mr. Davis then cut loose and went right away from him, leaving him three-quarters of a mile behind at the finish.

Second heat: J. H. McDuffie, first, 10:56; George Isham Scott, second, 14:16; T. E. Griffen, third. Mr. McDuffie won easily in his Mobile. Mr. Griffen stopped early in the race, owing to an accident to his gasolene.

Final heat: McDuffie, first, 10:52; Davis did not finish. Mr. Davis attempted too quick a start and met with an accident which put him out of the race immediately.

Gasolene Vehicles

First heat: William K. Vanderbilt, Jr., first, 8:58½; Alexander Fisher, second, 13:23½; J. F. D. Lanier, distanced. Mr. Fisher was not in the race after the first half-mile. Mr. Vanderbilt cut loose, drove his Daimler with great nerve and skill, and won as he pleased.

Second heat: David Wolfe Bishop, first, by default.

Final heat: Vanderbilt, first 8:53½; Bishop,, second, 9:30. Mr. Vanderbilt soon took the lead. He passed the milepost 150 yards ahead. He finally won by more than a quarter of a mile. His time in this race was the fastest of the day. A 1:46 clip over a bad half-mile track was certainly creditable going.

Mixed Classes

Championship race: W. K. Vanderbilt, Jr. (Daimler gasolene), first, 8:54; Kenneth A. Skinner (De Dion gasolene tricycle), second, 9:22; A. L. Riker (Riker electric), third 10:28½; J. H. McDuffie (Mobile steam) did not finish. Mr. Riker went away in the lead and held it for a mile and a quarter before Mr. Vanderbilt began to overhaul him. Mr. Vanderbilt seemed timid at the start as though he feared a mix-up with the little fellows of the bunch. At the mile and a quarter, however, he pulled her wide open and let her go. A half a mile further on Mr. Riker was passed. At two miles Mr. McDuffie quit the race. At this point Mr. Skinner was following the electric. At four miles Mr. Riker, blinded by the big Daimler's dust, slackened a bit. The tricycler saw his chance and shot by. They finished in this order, separated in time as above.

VANDERBILT AND BOSTWICK CHALLENGED

Chicago, Sept. 6.—Alexander Winton of Cleveland to-day forwarded to W. K. Vanderbilt and Capt. Albert Bostwick at Newport, a challenge for an automobile race at 100 miles, to be decided on a smooth track. As a further incentive, a cup, valued at $800, will be given to the winner, provided the race is made a feature of the automobile exposition which is to be held at Washington Park, September 18 to 22. Mr. Winton is an enthusiastic automobilist, and participated in the recent Paris-Lyons race.

New York, Sept. 10.—In connection with the above dispatch it may be stated that your correspondent was told to-day by one on the inside of automobile racing matters, that Messrs. Vanderbilt and Bostwick were surely going to Chicago to race in the Inter Ocean tournament and that the Winton would be prominent in the racing. Perhaps two and two can be put together without much of an error. Five of Mr. Bostwick's cars are now housed at the storage station on Sixty-sixth Street. Mr. Bostwick has had two or three very successful trials of his De Knyff record-breaking Panhard the past day or two. He is evidently getting ready for business.

Mr. Vanderbilt's success at Newport shows his German Daimler to be keyed up to concert pitch.

If these gentlemen are going to Chicago, why don't they be real sporting chauffeurs, and race there in their trusty Panhard and Daimler?

STEARNS GASOLENE VEHICLE

Among the several promising manufacturers of motor vehicles in Cleveland, the metropolis of Ohio, is the firm of F. B. Stearns & Co. Backed by ample capital and with a well-equipped shop, they have been experimenting with gasolene vehicles for several years past, and, although they have built a number of practical carriages, it is only within the past few weeks that they have been offering machines for sale, having disposed of several in this city and other places recently. At present they are making deliveries within a reasonable time, and, when established in a new factory, for which arrangements are being made, they will be prepared to turn out goods in large quantities.

Their standard vehicle, as shown herewith, is a phaeton equipped with powerful motor and capable of high speed. After much experimenting the Stearns people have decided that a motor of high power weighs but a trifle more, and, if properly balanced, adds but little to the vibration of a carriage, and, in case of necessity, when climbing steep grades or when a racing speed is desired, the additional power is most valuable. Their motor is of the single-cylinder, four-cycle type, developing at a normal speed of 800 revolutions eleven brake horsepower. A speed of thirty miles an hour is guaranteed under ordinary conditions, and a somewhat higher speed than this can be reached, and it is claimed by the firm that they have never yet found a hill which they could not surmount.

The speed control is regulated almost altogether by a slide throttle valve on the mixture as it enters the cylinder, operated by a foot button. By manipulating this button the speed of the motor can be controlled at from 150 to 1,500 revolutions per minute. The speed of the vehicle is controlled by two hand levers so arranged that the natural instincts help in the performance. The high speed combined with brake on the engine shaft is practically all that is necessary for the control of the carriage. In fact it is claimed that this handle is used ninety-five percent of the time, and almost any hill can be surmounted without the aid of the slow speed. The second handle combines the backing and slow speed, and when not in use it drops down so as not to interfere with the manipulation of the high-speed handle. It is impossible to use both handles at the same time.

There is no countershaft in the speed control mechanism, this being regulated by a set of gears on the main shaft and with the high speed on; the power is applied direct to the rear axle without any other gearing, by means of a chain. The differential is combined with the rear sprocket. There is also a powerful band brake on the rear axle, which, however, is seldom used.

In preparing the fuel an atomizer or mixer is used. A small pump actuated by a cam forces an accurately measured spray of gasolene into a tube where it is mixed with air, the supply of which is also furnished by a pump. Thus the feed control is automatic at all speeds, giving uniform mixture, no matter what the speed or load.

The ignition is furnished by a storage battery, the spark being by contact. The control is of the make-and-brake type, regulated by a novel centrifugal device, which, it is claimed, makes it impossible to miss a spark and accurately regulates the time of explosion. The motor cylinder is surrounded by a water jacket containing three gallons of water, while a tank in the body of the carriage contains six gallons and is so connected with the motor that the circulation is automatic without the aid of pumps, and it is claimed that the circulation is sufficient to keep the engine cool almost indefinitely. The gasoline tank contains five gallons, which, the firm states, will operate the carriage 100 miles over any kind of roads.

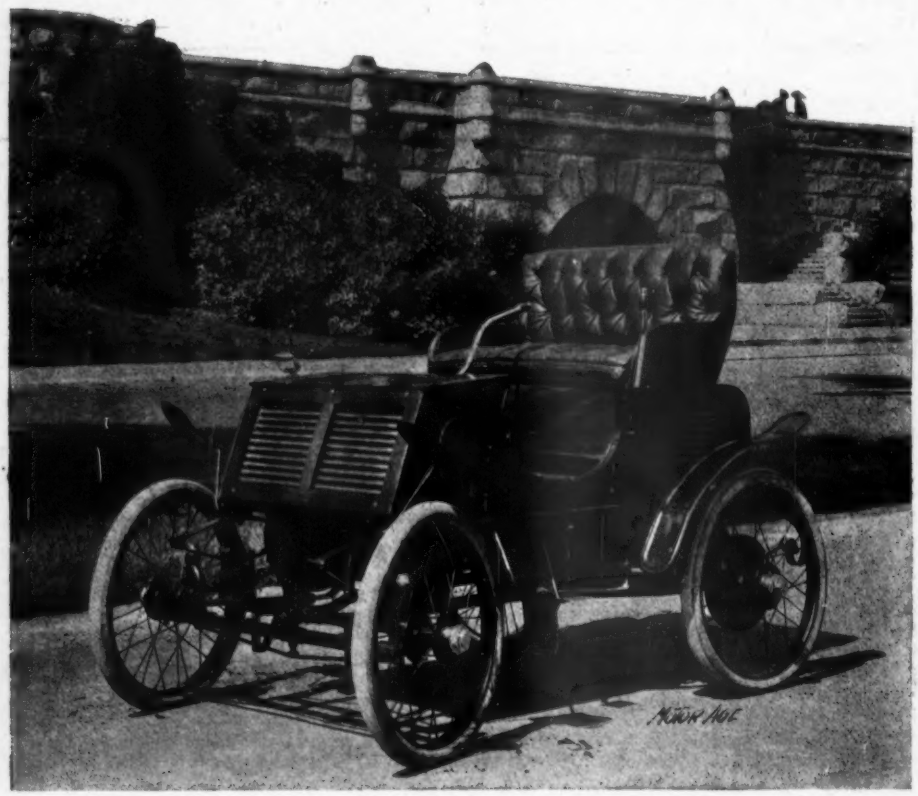
The firm claim that they prefer to

build a strictly high-grade carriage rather than to turn out large quantities, and they maintain that nothing but the most expensive material enters into the construction of their goods. For example, all gears are of gun metal or steel turned from the bar. The finish and carriage work is of the best. The wheels are 32-inch, with 4-inch Goodyear pneumatic tires. There are ball bearings in the steering wheels, with roller bearings on the rear axle. The top can be removed and a rear seat put in place, so that the carriage will readily carry six people if desirable. The wind dash contains a gasolene tank, batteries and a full set of tools, and has a compartment sufficiently large to carry packages. The firm also builds a delivery wagon of similar mechanism and attractive design. Price of phaeton or delivery wagon, $1,200.

F. B. STEARNS & CO.'S GASOLENE VEHICLE.

G. & J. GASOLENE VEHICLE

A new automobile is about to be introduced to the public from the Gormully & Jeffrey, Chicago, branch of the American Bicycle Co. It will be known as the "G. & J." Several new and in many respects unique features, as well as advantages are claimed for the new machine, which has been built under the personal direction of Charles T. Jeffery, son of the well known bicycle manufacturer. Young Mr. Jeffery became much interested in horseless carriages several years ago when the first races held in the west were given under the patronage of the Chicago Times-Herald in 1895 and 1896. His father gave him carte blanche to go ahead and see what he could do. The "G. & J." is the result of almost endless as well as costly experiments during the past four years. Mr. Jeffery is confident he has a "winner" and the public will be given an opportunity to test his assertions in the near future. Recently three of the machines were taken out for a practical road test to Milwaukee and return over all kinds of highways, country roads and village streets as well as city boulevards. The trip was in every way successful. No attempt at high running was made, but this will be done on a later date as they claim speed among the other advantages.



GORMULLY & JEFFERY GASOLENE CARRIAGE.

The vehicle is constructed more on French lines than American, in that the engine is set in the front of the vehicle

where it is easy of access. It also more equally divides the weight, which in other American machines is mainly back of the center. This has caused many accidents by the heavy weight in the rear slewing the carriage around in passing over car tracks, turning corners or stopping suddenly.

The engine is a two-cylinder, upright gasoline motor of five horsepower, employing the jump spark form of electric ignition. The power is transmitted by a single chain from the crankshaft to a countershaft. Only two speed changing gears are used, one for hill climbing and the other in reversing. At other times, as when traveling over city streets or smooth country roads, the power is taken direct from the shaft, the speed being regulated by a small lever operated by the driver's right foot and with which, by simple pressure, he can regulate the speed of the engine from 100 to 1,100 revolutions per minute. The large hubs on the rear wheels contain internal gears to which the power is transferred from pinions on the countershaft. The gearing is covered for protection from dust or mud.

The cylinders are water cooled. The water is forced into the jacket by a small pump on the igniter shaft and afterwards cooled by being forced through 120 feet of one-inch brass tubing coiled in front of the engine and under the seat of the carriage. The gasoline tank, also under the seat, carries seven gallons of fuel, sufficient, it is said, for a 140-mile run. The vehicle is provided with a large box suitable for carrying storm garments, which is lacking in most other vehicles and should prove a great convenience, especially to tourists.

The machine is provided with a band brake, controlled by a foot lever and working on a differential gear upon the countershaft.

The controlling lever mechanism is placed upon the left side of the carriage instead of the right as usual in automobiles. Whether this will become popular remains to be seen. It has many points in its favor, however. The chauffeur is placed at a much better advantage as vehicles always turn to the right, while in stopping the right side of the carriage is next to the curb, enabling the passenger to enter or alight without climbing or stumbling over the levers, bell button, brake and other obstructions upon the operator's side of the vehicle's floor.

The noise of the exhaust is well muffled and so controlled that scarcely any sound is noticeable, by passing into an oblong sheet iron box under the carriage bed.

In starting most gasoline motors it is necessary to give the engine a few preliminary revolutions by means of a crank operated at the side of the carriage, making it necessary for the operator to climb into the vehicle after he started his engine. By means of the lever shown in the right front of the carriage the engine is started without the chauffeur leaving his seat.

The weight of the carriage is 1,000 pounds. The wheels are thirty-two inches in diameter with two-inch pneumatic tires and ball bearings. The frame is composed of 1¼-inch steel tubing. The motor has an enclosed crank case and splash lubricator.

AN INDIANAPOLIS ELECTRIC TRAP

The National Automobile & Electric Co. of Indianapolis, which was organized by L. S. Dow and Philip Goetz, formerly of the Waverley branch of the American Bicycle Co., during the present year, have turned out their first vehicle, an electric, of course. The company has a splendidly equipped plant which was built for them. The officers of the company are L. S. Dow, president;

A. C. Newby, vice-president, and Philip Goetz, secretary and treasurer. Concerning the new vehicle, President Dow writes:

"We take pleasure in sending you under another cover by this mail a photograph of our first production. We have plenty more about ready to come out and expect to make a very fine exhibit at the Madison Square Garden in November, where we have a very large space engaged.

"The wagon of which we send you a photograph we call a New York trap, and we have designed it for park and boulevard use in large cities. It is very powerful, having a radius of action of about fifty miles on a single charge of the battery. It is equipped with one 2½-horsepower motor geared directly to the rear hubs, and has a compensating gear in the motor shaft. The running gear frame is tubular, the wheels are wood with solid rubber tires and the vehicle is fitted with ball bearings throughout. It has five speeds forward and three backward, the maximum forward speed being fifteen miles per hour. It is splendidly built, elegantly finished and the only vehicle which we have ever seen that is absolutely silent in action.

"We can safely say now that we are ready for business and we can make deliveries of almost anything in the next four or five weeks and shall be glad to appoint agents in principal cities wherever we find interested persons with sufficient capital and suitable facilities for the proper conduct of our business.

"Our line of electrics will consist of seven or eight styles, beginning with a small open runabout, very attractive in design, at $1,000, and will contain road wagons, with or without tops, stanhopes, four-passenger breaks, small dos-a-dos park traps, and combination delivery and pleasure vehicles, the prices ranging from $1,000 to about $1,750.

"We have an elaborate catalogue in preparation which will be completed as soon as all our designs are available for purposes of illustration."

THE NATIONAL AUTOMOBILE & ELECTRIC CO.'S NEW YORK TRAP.

CHICAGO INTER OCEAN TOURNAMENT

PREPARATIONS FOR THE EVENT WELL IN HAND—REDUCED RAILROAD RATES SECURED—LARGE LIST OF EXHIBITORS—REPRESENTATIVE MEN SELECTED TO TO SERVE AS OFFICERS—OTHER EXHIBITIONS

The pressure on the time of the management of the Chicago Inter Ocean caused by its motor-vehicle tournament and exhibition has obliged them to abandon their regular work and to seek separate quarters, which have been established at room 1013 New York Life Building, at the corner of La Salle and Monroe streets. There has been installed there a corps of stenographers and clerks who are attending to the details of the event under the direction of Manager Tiernan.

Rules for Exhibitors

At Washington Park Track a man has been placed in charge of the installation of exhibits. The following rules have been issued, governing the installation:

All exhibits must be installed complete, not later than midnight of Monday, September 17.

Extraordinary care will be exacted by the management from all exhibitors as to fire risk. Sufficient force must accompany each exhibit to take all possible precautions against fire.

All disputes as to precedence in location of space and program shall be submitted to the supervisor of exhibits, whose decision will be final.

All decorations, signs, division partitions, chains, etc., displays of all kinds, shall be subject to acceptance by supervisor of exhibits.

Each exhibitor shall take down and remove from the grounds all decorations and debris of any description on his space. Exhibits must be removed not later than midnight, Tuesday, September 25. This is imperative.

A register of manufacturers and exhibitors will be maintained at the Inter Ocean booth and all manufacturers and others who are interested in the motor industry are requested to register. All mail, telegrams, for exhibitors and attaches will be distributed from this booth.

The management is most earnestly desirous of impressing upon the minds of the exhibitors the great importance of precaution against accident of any kind. Serious accident at this demonstration will result in much injury to the industry. Let us all be careful.

A restaurant will be maintained upon the grounds where exhibitors and attaches may procure meals at very low prices. Lodging accommodations for attaches will be found in convenient proximity to Washington Park. Information may be had at the Inter Ocean booth as to terms, location, etc.

Insomuch as all exhibit space was sold with the privilege of personal selection (first come, first served), the final allotment of such space will take place beginning September 10, after which time all locations will be made subject to the decree of the supervisor of exhibits.

Ship all freight addressed care Great International Automobile Exposition-Race Meet, Washington Park Club Grounds, Chicago, via Illinois Central Railroad.

In regard to the placing of signs and decorations in the booths of the various exhibitors there are no special rules, the only restrictions being that no exhibitor shall arrange his space in such a manner as to interfere with the view of the space of any other exhibitor.

Reduced Railroad Rates

Reduced railroad rates have been secured on all the railroads of the country from coast to coast. The rate is one and one-third fare for the round trip.

For the benefit of out-of-town exhibitors, it may be observed that the best route by which to reach Washington Park Track is the South Side Elevated Railroad, the trains of which stop at all the downtown stations on the elevated "loop." The grounds can also be reached by means of any of the south side surface cars by transferring on Sixty-First Street.

Invitations Sent Out

Engraved invitations have been sent to a large number of owners of motor-vehicles to attend the meet by the Inter Ocean and the Chicago Automobile Club.

The invitations bear the names of the officers of the club.

Brooke's Marine Band has been engaged to render a musical program every day of the tournament.

Manufacturers visiting the tournament are invited to avail themselves of the offices of The Motor Age, where mail may be directed and appointments made. The location at 324 Dearborn Street is in the center of the city.

The following is the revised list of exhibitors, several names having been added since the list was published in The Motor Age previously:

List of Exhibitors

Chicago Motor Vehicle Co.
Triumph Motor Vehicle Co.
Crowdus Automobile Co.
Gormully & Jeffery branch of the American Bicycle Co.
Hewitt-Lindstrom Motor Co.
Canda Bros. Auto Quadricycle Co.
Woods Motor Vehicle Co.
Waverley branch of the American Bicycle Co.
C. C. Hill Automobile Co.
Locomobile Co. of America.
De Dion-Bouton Motorette Co.
Riker Motor Vehicle Co.
Winton Motor Carriage Co.
E. R. Thomas Motor Co.
World's Dispensary Automobile Co.
Hub Motor Co.
Eastman Automobile Co.
Olds Motor Works.
McMullen Power Co.
Friedman Automobile Co.
Kokomo Rubber Co.
Helios-Upton Co.
St. Louis Motor Carriage Co.
Giddings & Stevens Motor Vehicle Co.
United States Ball Bearing Co.
Consolidated Rubber Tire Wheel Co.
Buffalo Gasolene Motor Co.
Mobile Co. of America.
New York & Ohio Co.
The Motor Age.

Officials Named

The following officials have been selected for the contests:

Technological Committee: William D. Ray, chairman and special expert for the Inter Ocean; H. M. Brinkerhoff, general manager of the Chicago Metropolitan Elevated Railroad; M. L. Summers, M. E., E. E.; Henry R. Pierce, M. E., E. E.; Prof. C. V. Kerr, chair of Technology and Mechanical Engineering of Armour Institute; Prof. Henry Crew, chair of mechanical engineering of Northwestern University; Prof. Paul Mellen Chamberlain, chair of technology and mechanical engineering, Lewis Institute; and Prof. John E. Sweet of Vanderbilt University.

Judges, observing: M. M. Kirkman, second vice-president of the Northwestern Railroad; Paul Morton, vice-president of the Santa Fe Railroad; Arthur J. Eddy, president of the Chicago Automobile Club; F. S. Fish, South Bend, Ind.

Judges of Racing: Charles T. Yerkes, Arthur Catton, C. K. G. Billings, Will J. Davis and Brode B. Davis, all prominent Chicagoans.

Starter, Richard J. Dwyer.

Clerk of the course, Hugh Keough.

Handicapper, Alderman Frank T. Fowler.

Supervisor of entries, L. M. Houseman.

Weigher-in, C. G. Graves.

Purser, Charles J. Gray.

Professional Entries

The entries of the professional chauffeurs C. G. Ridgeway, Albert Champion and Kenneth A. Skinner have been received for the races. Ridgeway is on his way to Chicago in his carriage. Among the manufacturers who have entered in the races are Alexander Winton, who is anxious to meet Vanderbilt and his famous German "white ghost," and A. L. Riker, the hero of the race on Long Island, early in the season. W. K. Vanderbilt and Albert J. Bostwick, have likewise promised to be on hand, according to Manager Tiernan.

The following is the revised program of the contests:

Tuesday, September 18

Grand automobile parade for manufacturers—First prize, gold medal, for greatest number of practical designs; second prize, gold medal, for greatest number of autos in line; third prize, silver medal, for most practical and unique design.

One-mile race, flying start—For steam vehicle; first prize, gold medal; second prize, silver medal.

One-mile race, flying start—For gasoline vehicle; first prize, gold medal; second prize, silver medal.

One-mile race, flying start—For electric vehicle; first prize, gold medal; second prize, silver medal.

Obstacle race—Prize of a gold medal for best time in passing through obstacles.

Grand auto parade for private owners—Gold medal prize for most elegant

turnout; gold medal prize for auto carrying the greatest number of seated passengers.

Ten-mile race, free for all—First prize, gold medal, to winner; second prize, silver medal, to most dexterous operator; third prize, gold medal, to the best appearing vehicle.

Fancy and trick driving contest (open to all types of vehicles)—Gold medal for most difficult tests and practical demonstration.

Five-mile race for motor tricycle—First prize, $150 cash; second prize, $50 cash.

Wednesday, September 19

Manufacturers' practical utility test—Prizes, gold and silver medals.

Heavy draft contest for manufacturers and merchants—Prizes, gold and silver medals.

Auto gun carriage demonstration for government use (open to all kinds of motive power)—First prize, gold medal; second prize, silver medal.

Ten-mile mail race—First prize, gold medal to manufacturer of mail wagon for best time in finishing and making forty mail-box collections; second prize, $25 in gold to driver of prize-winning wagon; third prize, gold medal for most practical and best adapted wagon.

Pulling contest—One prize, gold medal, for best application of motive power of acetylene, alcohol, kerosene, compressed air and liquid air.

Ten-mile quadricycle race—First prize, $150 cash; second prize, $50 cash.

Automobile equestrian race—Being an event in which a running horse, ridden by Fremont Sloan, will compete with an auto; prize, gold medal.

Pioneer contest—Prize, silver cup for oldest automobile, steam, gasoline or electric power, to be exhibited.

Thursday, September 20

Grade climbing tests—Automobiles will be tested each in its class of motive power for greatest percent grade climbed from still position, greatest percent of grade climbed from flying start, and test of speed climbing fifteen per cent grade, ten minutes' duration. Tests also on declines. Prizes, gold and silver medals.

One-hundred-mile race—For manufacturers using carriages carrying four grown people; prize, silver medal.

One-hundred-mile race—For private owners using carriages carrying two grown people; gold medal.

Five-mile ladies' race—Prize, silver cup.

Ten-mile ladies' race—Gold medal.

Ladies' obstacle race—Silver cup.

Three-mile merchandise delivery race—First prize, $50 in gold; second prize, $25 in gold.

Fifteen-mile motor-pacing tandem race—First prize, $150 cash; second prize, $50 cash.

Automobile manufacturer's congress at Wellington Hotel at 8 p. m.—Address of welcome, etc.

Friday, September 21

Ten-mile road race for vehicles carrying four people—Prize, silver cup.

Ten-mile road race for vehicles carrying two people—Silver medal.

One-hundred-mile sweepstakes event for Inter Ocean challenge cup.

One-mile novelty race—Automobiles running backward. First prize, silver cup; second prize, silver medal. Entries limited, several heats if necessary.

Grand floral parade, 3 p. m.

Twenty-mile motor bicycle race—First prize, $150 cash; second prize, $50 cash.

One-hundred-mile Twentieth century race for motor tricycles, motor quadricycles, motor tandems and motor bicycles—First prize, $150 cash; second prize, $50 cash.

Saturday, September 22

Ten-mile manufacturers' race for steam vehicles—First prize, silver cup; second prize, silver medal.

Ten-mile manufacturers' race for gasolene vehicles—First prize, silver cup; second prize, silver medal.

Ten-mile manufacturers' race for electric vehicles—First prize, silver cup; second prize, silver medal.

Twenty-mile combination race to respective winners of above ten-mile race—Gold medal.

Five-mile transfer express race—Prize, silver medal.

Novelty design contest—Being a contest for designs in automobiles which will depart radically from the carriage type; prize, silver cup.

Gold medal prize for most original conception in an automobile that will still leave the vehicle acceptable and practical.

Grand illuminated automobile parade, 8 p. m., silver cup for most attractive display.

THE MOTOR AGE EXHIBITION

The Motor Age begs to announce an automobile exhibition, under its auspices, in the Chicago Coliseum, for the last week in March, 1901.

It had been planned to hold this exhibition during the present fall, but, on consultation with a number of manufac-

turers, it was ascertained that an exhibition held at the beginning of the buying season would prove more satisfactory to the majority. The matter was, therefore, left open until satisfactory dates could be decided upon, and all preliminary details settled. This decision was reached before the announcement of the Inter Ocean tournament. Such details have now been settled and the dates are assured.

The Coliseum, in which the exhibition will be held, is less than a mile from the center of the business district, is on one of the main arteries, Wabash Avenue, and is accessible from all sections of the city. The cars stop at the doors of the building. In size it is about fifty per cent larger than Madison Square Garden, and it will therefore be possible to install many more exhibits on the main floor than in the Garden. A large gallery surrounds the entire building, having a seating capacity of 5,000 persons. The size of the building permits of the installation of a twenty-foot track on which exhibitors can show the paces of their vehicles—three abreast, if they so desire. The size of the building also permits of plenty of aisles of ample width, while the addition of a gallery which will overlook the entire track from all portions will tend to prevent congestion of the aisles and will give the visiting public ample opportunity to see the vehicles on the track, as well as to examine them in the various booths.

The charges for space will be reasonable and the exhibit will be conducted with the idea of furthering the interests of the industry, rather than for any immediate profit. The management is the same as that of all the successful bicycle exhibitions held in Chicago, a fact which insures the smooth running of the event.

THE GUTTENBURG CARNIVAL

New York, Sept. 10.—The motor vehicle trade is taking considerable interest in the automobile exhibition, parade and races in connecton with the Tri-State Fair at Guttenburg, September 18 to 22. The Locomobile Co. of America, the American Bicycle Co., the Electric Vehicle Co., the De Dion Motorette Co., and the Riker Electric Vehicle Co. are among those who will be represented in the exhibit and parade by several vehicles each. Albert C. Bostwick has interested himself greatly in the races and arrangement of the program for them. The races and parade will occur on Tuesday, the opening day. There will be races between automobilists and horses on Saturday.

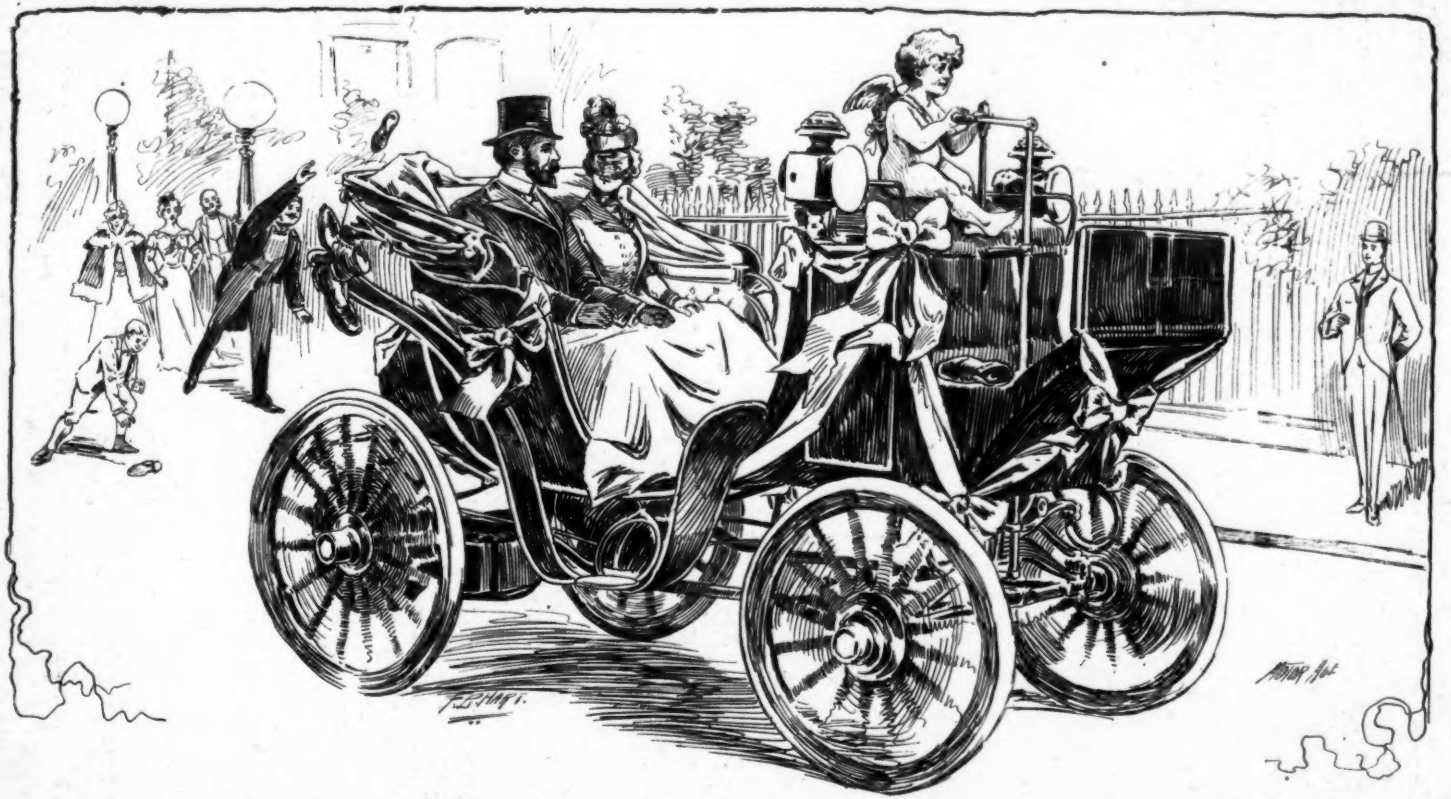
NEW YORK "PALACE" SHOW

New York, Sept. 10.—Preparations for the two automobile shows go right along and while each manager works independently of the other, the exhibitors seem disposed to consider both together. The Madison Square Garden show, which will run from November 3 to 10, will be followed by the one at the Grand Central Crystal Palace, November 14 to 24. A point in favor of the Palace show is that it will be held simultaneously with the horse show, which is such an important feature in New York that more than 50,000 visitors from out of town attend each year.

The horse show visitors will naturally be interested in automobiles. They can pass from one show to another and thus make comparison between the motor-vehicles and the most modern driving turnouts.

There will be a large representation at the Palace, most of the concerns who intend to exhibit at the Garden having already arranged for larger blocks of space at the Palace. This is in part due to the fact that Manager Nathan has made the terms so moderate that no exhibitor need feel any need of crowding his space. Platforms will be unnecessary and most of what are known as extra charges have been abolished. A vehicle can be shown to advantage in a space 10x12 at a cost of $60 for the whole term of the show. Exhibitors at the Madison Square Garden may move their display at any time after the close of that show to the Grand Central Palace at no more trouble or expense than it would take to run their vehicles around Madison Square.

CUPID AS A CHAUFFEUR



AUTOMOBILE WEDDINGS ARE NOW MUCH IN VOGUE.

CONSTRUCTION OF A GASOLENE MOTOR

THE PRACTICAL CONSTRUCTION OF A FOUR-HORSE-POWER AUTOMOBILE GASOLENE MOTOR WITH TWO OPPOSED CYLINDERS, ACCOMPANIED BY WORKING DRAWINGS.

BY L. ELLIOTT BROOKES

PART IV.

Fig. 54 shows the gear which operates the exhaust and ignition cams. This is of phosphor bronze and needs a pattern.

Fig. 55 shows the pinion which is of tool steel. After the gear is machined, the tap drill for the 5-16-inch, 18-tap should be run through the two holes shown. Before tapping them out, put the gear on the exhaust cam sleeve up to the shoulder. It should be a tapping fit. Then drill through the two tap drill holes, until the shoulder of the drill is in the sleeve 1-16 of an inch. Then take off and tap out the holes a snug fit for 5-16-inch, 18-thread, headless, cup point, set screws. These are to be ⅜ of an inch long, and, when screwed in place, should be just flush with the outside of the hub. The pinion should be fitted to its proper place in the same way. A ¼-inch, 20-thread, headless, cup-point, set screw, ⅜ of an inch long, should be used, and the shoulder of the tap drill should be drilled ⅛ of an inch into the crank shaft, in the manner just described. Before tapping the hole locate this hole as shown, and on no account attempt to put the set screw on the key, as, in the first place, there is not sufficient length for the thread, and, secondly, it will not make a satisfactory job. The gear and pinion are both No. 10 diametral pitch, and should be very carefully cut to insure smoothness in running. The gear has 36 teeth, and the pinion, as a matter of course, 18 teeth.

For the gear case shown in Fig. 56, a very nice, solid pattern should be made, with core prints for the side and end openings. A core box will, of course, be needed and should be very carefully made to the sizes given on the drawing, to insure getting good castings, which should be of a very fine quality of cast iron. First plane off the foot, which can be done nicely on a shaper, then clamp to the face plate of the lathe and bore out the 1⅞-inch hole, finishing the shoulder to the sizes given. The 1 1-16-inch hole, on the side, is for the plunger rod guide shoulder to set in, and should be cored out as shown. In planing off the foot, attention must be given to this hole, so as to locate it exactly in the right position, which is 1⅞ inches from the foot. The facing

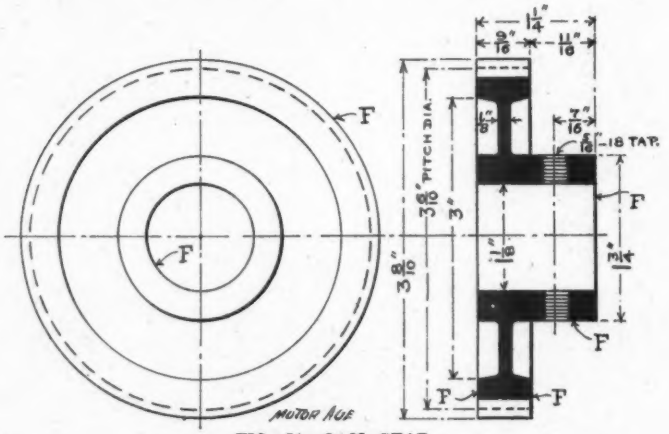


FIG. 54.—CAM GEAR.
2—Phosphor Bronze.
3 6-10-inch Pitch Diameter. No. 10 Diametral Pitch. 36 Teeth (Involute).

upon which the plunger rod guide (Fig. 51) sets, should next be finished off on a shaper, care being taken to locate it exactly central with the screw holes, as shown, and also to get it the proper distance from the center of the 1⅞-inch hole, according to the figure given in the drawing, which is 2⅝ inches. The No. 12, 24-thread tap holes and the 11-32-inch drill holes in the flange, can now be put in, as well as the 5-16-inch, 18-thread tap holes in the plunger rod guide seat. The 5-16-inch, 18-thread tap holes in the facing side of the crank chamber, for the gear cases can now be laid out and drilled and tapped. To properly locate these tap holes, screw the exhaust cam sleeve studs in place, and make a bushing or collar about ¾ of an inch wide, with a ¾-inch hole and a 1⅞-inch outside diameter. Put this on the stud and set the gear case over it. Then square up the facing for the plunger rod guide, clamp securely in place, and mark through the 11-32-inch holes.

This completes the admission and exhaust valve mechanism, and the ignition device will now be taken up.

Fig. 57 is a front view of the ignition device with the cover removed, with the ignition cam shown in place, and the contact makers attached to their insulating blocks, showing the connectors and the contact makers to the outside binding posts. These binding posts are attached to the rear portion of the case on each side, as shown, by means of lugs which stand out at right angles to the back of the case. From this view

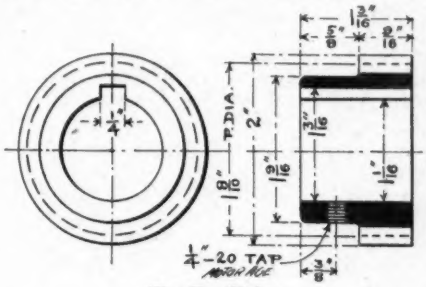


Fig 55.—Pinion.
1—Tool Steel.
1 8-10-inch Pitch Diameter.
No. 10 Diametral Pitch. 18 Teeth (Involute).

a very clear idea may be obtained of the ignition mechanism construction.

Fig. 58 shows a front view of the insulating block with the contact makers attached in place, and also a side view with the rear portion of the ignition case in section, showing the method of attaching the insulating block to the back of the ignition case. The contact makers (of which there are two for each case, as shown) should be of spring brass or helmet bronze, of No. 18 B. & S. gauge. They are attached to the insulating block by means of No. 6, 32-thread, button head, brass machine

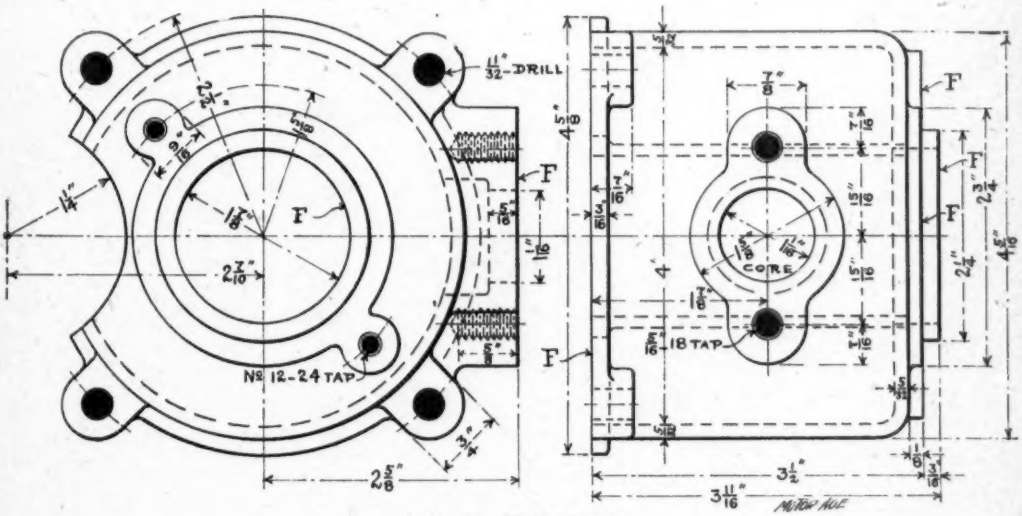


FIG. 56—GEAR CASE.
2—Cast Iron.

screws, with small brass washers (Fig. 65) behind the nuts. The dimensions for laying out these pieces are clearly shown

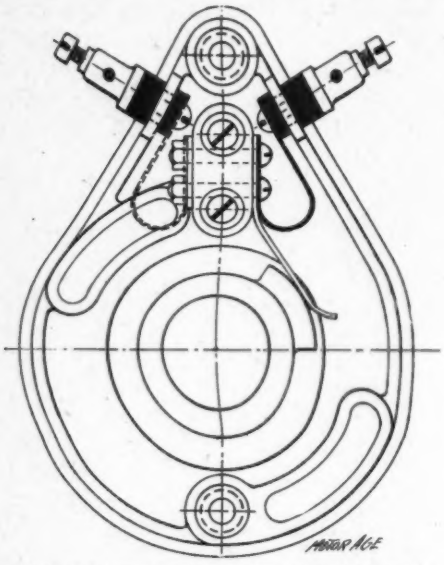


Fig. 57 —Ignition Mechanism (assembled, with cover removed).

in this figure, so that no further explanation is necessary.

The contact makers are shown in Fig. 58, set for left-hand rotation of the motor. If right-hand rotation is desired, it is only necessary to change around from right to left-hand side of the insulating block.

Fig. 59 is the rear portion, or back, of the ignition case, and carries the mechanism. This should be made of bronze and very true to the pattern. Hold in a chuck with the rear side out, and bore out the 2¼-inch hole and face off the back of the hub. Then finish the face side on a shaper. In boring out the 2¼-inch hole, pay particular attention to getting the 5-16-inch cored slots concentric with the hole. Drill and tap the holes in the face, as shown, and also the 5-16-inch holes in the lugs for the binding post.

Next take the cover (Fig. 60), which can be made of aluminum, and, before drilling the 5-16-inch holes, fit it to the rear portion or back of the case. Use a small square file and make an easy fit, but not too loose. Time and trouble will be saved by fitting the base and cover pattern together while being made.

Fig. 61 shows the ignition cam. This requires a pattern, and should be of bronze. Finish to the sizes given in the drawing and make a nice fit on the exhaust cam sleeve. Drill and tap the two ¼-inch, 20-thread holes shown, which are for ¼-inch, 20-thread, headless, cup-point set screws, which should be tight fits.

The studs for holding on the ignition case cover are shown in Figs. 62 and 63. They should have flats cut, as shown, on the 9-16-inch portion, to permit them to be screwed in place in the rear casting.

Fig. 64 shows the thumb nuts for the ignition case cover studs. If they cannot be picked up at a supply house, a small pattern must be made and four brass castings made.

The holding-down screws for the ignition cases are shown in Fig. 66. They

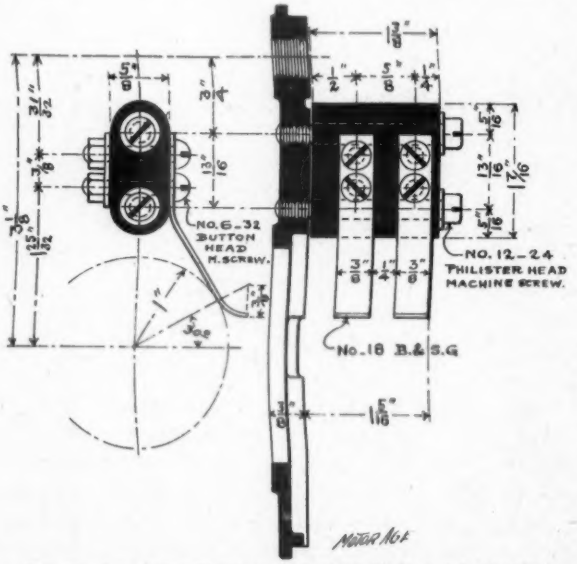


Fig 58.—Insulation Block, with Contact Makers Attached, of No. 18 B & S. Gauge, Helmet Bronze.

should be made a shade longer than the thickness of the rear portion or back of the case, which should be ⅜ of an inch

through when it has been finished up.

It will be noticed that the gear case shown in Fig. 56 has two bosses forming part of the shoulder facing, and that they are one-sided with regard to the portion of the gear case which is shown cut away at the left-hand side of the drawing, but, when the casting is turned back, half-way around, the plunger rod facing

Figs. 67 and 68 show the small, hard-rubber bushings and washers for attaching the binding posts to the lugs in the rear portion of the ignition case. The binding posts themselves are shown in Fig. 69, and can be obtained from any electrical supply house.

Fig. 70 shows the connectors for making the connection between the contact

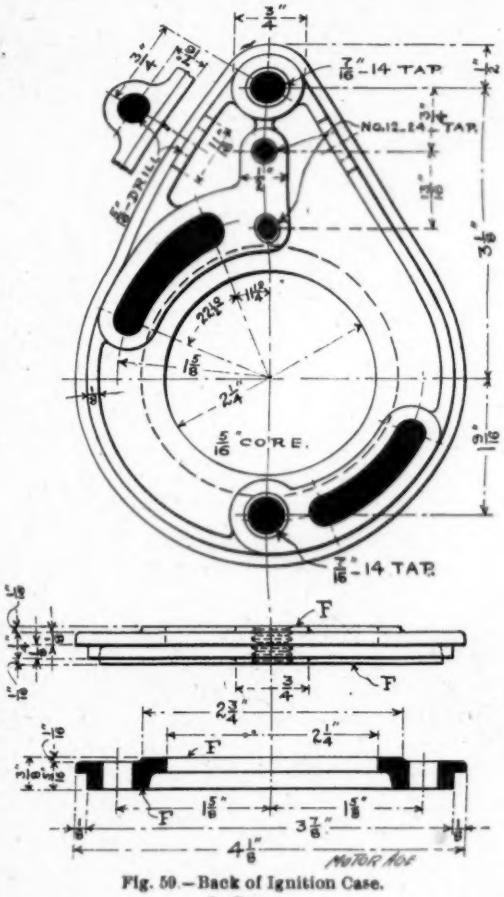


Fig. 59.—Back of Ignition Case. 2—Bronze.

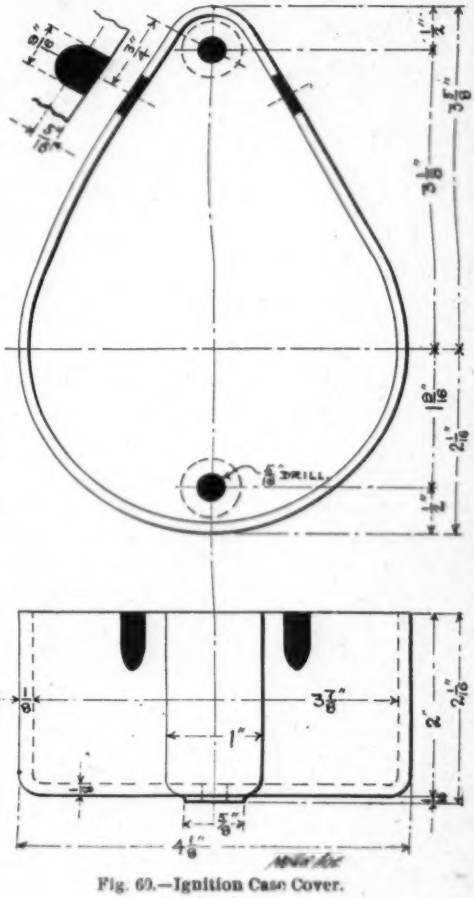


Fig. 60.—Ignition Case Cover. 2—Aluminum.

points in the opposite direction, but the angle of inclination of the two bosses remain the same, and consequently only one pattern is needed.

The washers to go behind the hexagon nuts on the No. 6, 32-thread, button-head machine screws are shown in Fig. 65, and the No. 12, 24-thread philister head machine screws are clearly shown in Fig. 57, in place. Small washers, as shown, should be used under the heads.

makers and the insulated binding posts. They are made from soft sheet copper, about 3-64 of an inch thick. After being drilled and made ready to put in place, the narrow portion should be wound very tightly from end to end, between the eyes, with a strip of sticky tape, about 3-16 of an inch wide (such as is used for electrical purposes). When they are dry, coat them with a little yellow shellac varnish, and allow them to

dry thoroughly before bending to shape. The long connector shown in full lines goes on the right-hand side, as shown in Fig. 57, and connects with the contact maker farthest out. The shorter one, indicated by dotted lines, goes on the other side, as shown by the dotted lines on the left-hand side of Fig. 57.

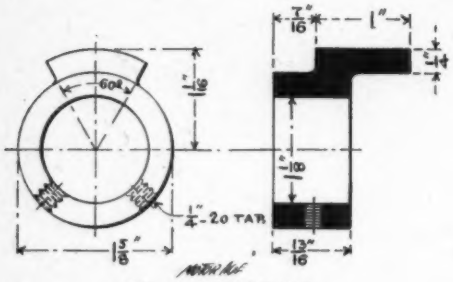


Fig. 61.—Ignition Cam.
2—Bronze.

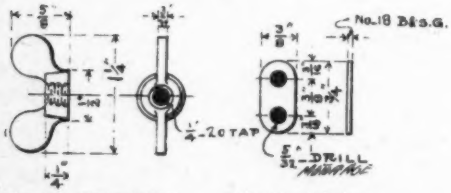


Fig. 64—Thumb Nut.
2—Brass.

Fig. 65—Washer.
2—Brass.

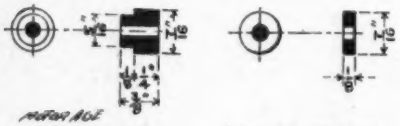


Fig. 67—Bushing.
2—Hard Rubber.

Fig. 68.—Washer.
4—Hard Rubber.

Insulation for Binding Posts.

Fig. 69—Binding Post.
4—Brass (Nickel Plated).

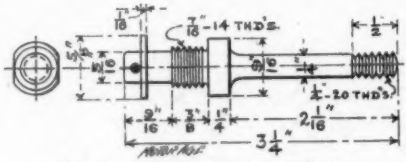


Fig. 62.—Ignition Case Cover Studs.
2—Steel.

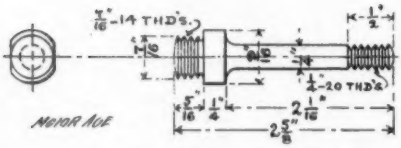


Fig. 63.—Ignition Case Cover Studs.
2—Steel.

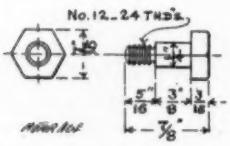


Fig. 66.—Holding Down Screws.
4—Steel.

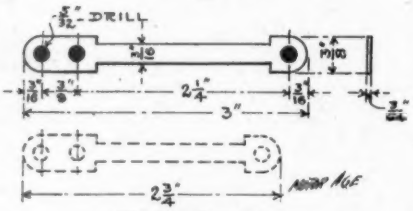


Fig 70.—Connectors.
2 Each—Copper.

Having now finished the details of the ignition mechanism, the insulating block (which should be made of hard rubber or vulcanized fiber, with contact makers in place and connectors attached), can be screwed firmly in position upon the rear portion, or back, of the ignition case. The connectors can now be attached to the binding posts by putting the small button-head screw in the single hole in the end of the connector and putting on the hard rubber washer. Put the hard rubber bushings in the holes in the lugs, allowing the binding post screws to fit easily in the holes in the bushings. The binding posts can then be screwed into place tightly by using a small nail or piece of steel wire in the side holes. The cover studs can be screwed to place and the cover put on, and the whole laid aside until the motor is ready to be assembled, which will be soon, as the machine work and the making of the parts necessary to complete the motor proper is almost done.

Fig. 71 shows the bar for operating the ignition mechanism, which goes on the ends of the long studs shown in Fig. 62, which project through the back of the rear portion of the ignition case.

They should be fitted with split pins and washers, as shown, to hold the bar in place.

Next in order (and a very important factor in connection with the ignition mechanism which has just been finished) are the ignition plugs (Fig. 72). These are made from cold-drawn hexagon steel. The shoulders of the threaded portion of the plug proper and the bushing must be undercut. The external and overall dimensions are given, and also details of the sparking rod and point, but the actual dimensions of these cannot be given on account of the varying sizes of the insulating tubes or plugs, no two makes being alike in any of their measurements. This is, however, easily settled by purchasing them first and making the holes in the bushing and plug to suit. The rods must be made of proper size to fit easily in the insulating tubes. Make a head on the rod, as shown, and braze in the platinum point (which must not be less than 1-16 of an inch in diameter), and rivet the platinum plug in the side of the shell of the plug proper, as shown. Allow not more than 3-64 of an inch between the platinum points. Put an asbestos washer under the head of the rod, as shown; also one on the outside end of the insulating tube over the rod, with the small brass washer, as shown. This must not be omitted. It is to prevent the asbestos washer from being destroyed by the tightening up of the first nut. The hole in the bushing for the insulating tube should be made a trifle larger than the outside diameter of the tube at that point. Asbestos washers are also to be put on either side of the large part of the insulating tube, as shown, and should be about 1-16 of an inch thick. The 1⅛-inch, 16-thread on the outside of the plug should be an easy screwing fit in the hole in the explosion chamber, as the shoulder of the hexagon is intended to make the fit. It must be absolutely true, and undercut as shown.

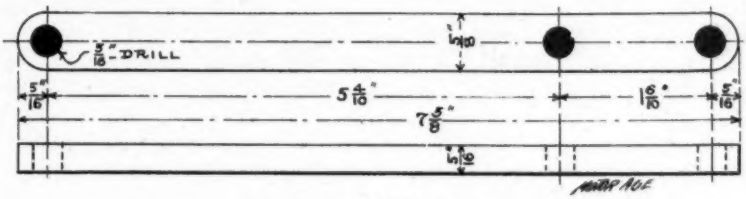


FIG. 71.—ROCKER BAR.
1—Steel.

The fly wheel is shown in Fig. 73, only one view being given, as the other view is shown well enough in Fig. 1 to give an understanding of its design. It is made of cast iron, has six spokes, or arms, ½-inch thick and 1¼ inches wide at the run, and 1½ inches wide next to the hub, being of flat oval section. The wheel can be held in a chuck by the long end of the hub and the 1 3-16-inch hole bored out to be a nice fit on the crank shaft. Rough out as far as possible and then put on a mandrel and finish as shown. Cut the keyway in the hub to fit the key onto the crank shaft, and drill the tap hole in the hub, as shown. Before

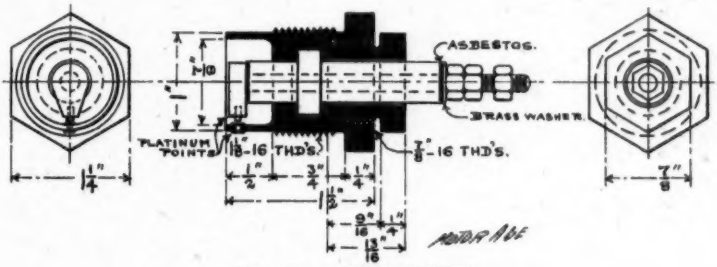


FIG. 72.—IGNITION PLUG.
2—Complete.

tapping out the hole, put the fly wheel on the crank shaft and drill with a tapping drill into the crank until the shoulder of the drill is in at least ⅛ of an inch. Then take the fly wheel off and

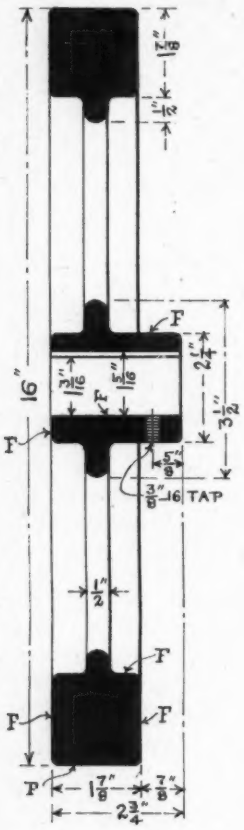


Fig. 73.—Fly Wheel.
1—Cast Iron.

tap out the hole ⅜-inch, 16-thread, as shown.

The last detail to be made before assembling the motor is the starting lever, or crank, shown in Fig. 74. After turning up the hub end, out of a piece of machinery steel of the required size, drill a ⅜-inch hole though, near the end, as shown, and file or shape out the inclines, as shown. These should extend to within about ¼ of an inch of the opposite side, in either case. The direction of the angle of the side of the slots will, of course, depend on the direction of rotation of the motor. Make a spindle for the handle out of 1⅛-inch cold-drawn or Bessemer steel. Turn down, as shown, to 7-16 of an inch, and then get a piece of steel tubing ½-inch outside diameter and 1-32 of an inch thick, for a ferrule for the inside of the handle, which should be of hard wood. This ferrule should be an easy running fit on the 7-16-inch spindle. A large-sized hardwood file handle can be obtained, and, by boring out the hole to make a snug fit for the ferrule, a good handle is obtained. The end of the spindle is turned down to ⅜ of an inch, and threaded ⅜-inch, 16-thread. A small, half-oval steel washer is made to hold the handle in place, with a slot or two pin holes in the round side, by which to screw it into place. Do not attempt to secure the handle from coming off by putting on a plain washer, and riveting over the end of the spindle, as, if the wood portion of the handle should crack or split, there will be difficulty in getting the washer off, and a new spindle may be necessary. It may take considerable time to make the starting lever in the way shown, but it will be more satisfactory when finished. The handle portion and the hub are attached to a ⅝-inch cold-drawn steel rod which is made a tight fit in both and securely

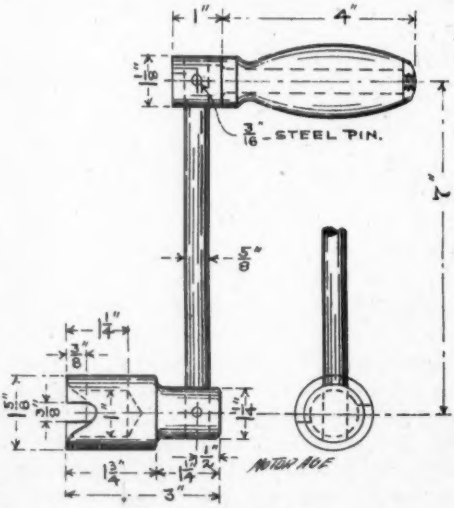


Fig. 74—Starting Lever.
1—Complete.

held in position by 3-16-inch steel pins, the holes for which should be slightly countersunk and the pins riveted over after being driven in place.

WEEKLY PATENT OFFICE BUDGET

FOUR INVENTIONS OF WHICH NONE IS STRIKINGLY CONSEQUENTIAL—SIMPLE RUNNING FRAME FOR LIGHT VEHICLES—TRANSMISSION DEVICE WITH THREE DIFFERENTIAL GEARS—A FREAK MOTOR AND A RUBBER TIRE FASTENER

Last week's batch of motor-vehicle patents comprised but a single patent. This week the number is swelled to four, but only two of them are interesting. One patent relates to a solid rubber tire fastening, and this subject is a special one and inventive creations bearing upon it very seldom possess much novelty, although, it is true, they may often be of considerable manufacturing value.

Another of the four patents is granted to a schemer whose slight notoriety rests upon the fact that he cannot scare the compressed air bee out of his bonnet and upon his somewhere-gotten delusion that he can handle such light mediums much the same as a fireman handles a stream of water—through a nozzle. The third patent relates to a simple running frame which provides for independent inclination of the wheels to compensate for rough surfaces. This is by Hiram P. Maxim, one of the patentees of a frame for a light motor delivery tricycle, illustrated in The Motor Age in the issue of April 26, 1900.

The remaining patent of the quartette consists of means for mounting wheels inclinably in accordance with the principle involved in the support of dished wooden-spoked wheels, and of a system of triple compensating gear used in connection with four-wheel traction.

The complete specifications, claims and drawings of any patent will be furnished by the patent office at Washington for five cents each. Persons sending for patents should address their letters "Commissioner of Patents, Washington, D. C.," and should enclose five cents for each copy of every patent desired, and should state the numbers and dates of the patents. Each patent described in The Motor Age is preceded by its number and date. The date of any patent described in earlier issues, in which dates were not given, can be ascertained by deducting nine days from the date of the paper in which it was described.

MANY COMPENSATING GEARS

Letters patent No. 657,381, dated September 4, 1900, to William O. Barnes, Stamford, Conn. Inclinably mounted wheels and four-wheel drive for motor vehicle. Twenty-one claims allowed.

The first portion of this patent relates to the mounting of the front wheels whereby the hubs are inclined so that the wheels spread apart from the ground

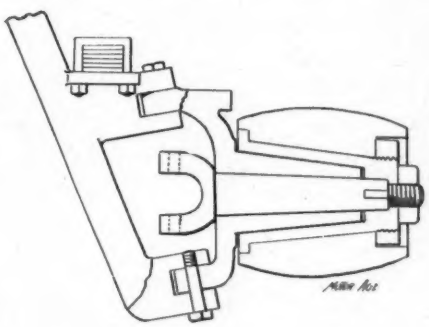


Fig. 1—Barnes' Steering Knuckle.

upward (which is a condition too old to need discussion) and so that the axial line of the steering knuckle or hinge will intersect the ground a short distance inward from the vertical plane of the wheel. The stub axles are connected together by the usual steering rod connections. The inventor avers that the prescribed inclination of the steering axles will tend to keep the steering wheels straight, since the turning of the wheels to either side will cause the main, or vehicle body supporting, axle-tree to

be raised above its normal distance from the ground.

The construction of the steering knuckle and stub axle is clearly shown in Fig. 1, which also depicts the centrally located secondary stub axle whereby motive rotation may be transmitted to the steering wheel. Connections between the front driving shaft and these driving stub axles is by means of an ordinary knuckle joint which compensates for the inclination of the wheels and their respective axles.

The rear wheels, which are also employed for driving, are mounted upon the usual divided axle with differential gear and the hub skeins are set so

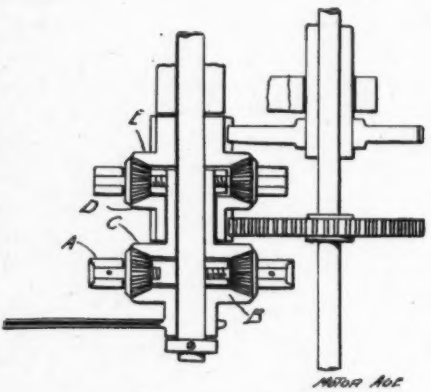


Fig. 2—Barnes' Transmission Gear.

that the wheels will be inclined the same as the front wheels.

The motor shaft, which is driven by an internal combustion or other suitable motor, is arranged transversely of the vehicle between the front and rear axles and adjacent to the front axle. The transmission mechanism is shown in Fig. 2. A disk A is keyed to the driving shaft and in it are mounted two bevel pinions which mesh with bevel gears B and C. These gears are loosely mounted on the driving shaft and to the hub of gear B is secured a sprocket whose chain runs over and drives the rear wheel axle differential.

The oppositely extended hub of gear C carries a disk which contains a second pair of bevel pinions, which in turn mesh with bevel gears D and E, D being loosely mounted on the hub of C, and E upon the axle. A spur pinion on the gear D meshes with a spur gear keyed to one section of the divided front wheel axle and a pinion on E engages a similar gear keyed to the other section of the axle. There are thus three differential gear sets in the transmission device, one for the rear wheels, one for the front wheels, and one (that composed of bevel gears B and C and their pinions) to compensate for unequal rotaton of front and rear axles. The inventor has accordingly provided for all possible contingencies in the line of varying wheel travel in connection with four-wheel traction.

MAXIM'S HINGED FRAME

Letters patent No. 657,430, dated September 4, 1900, to Hiram P. Maxim, Hartford, Conn., assignor to the Electric Vehicle Co., Jersey City, N. J., and New York City. Running frame for vehicles. Four claims allowed.

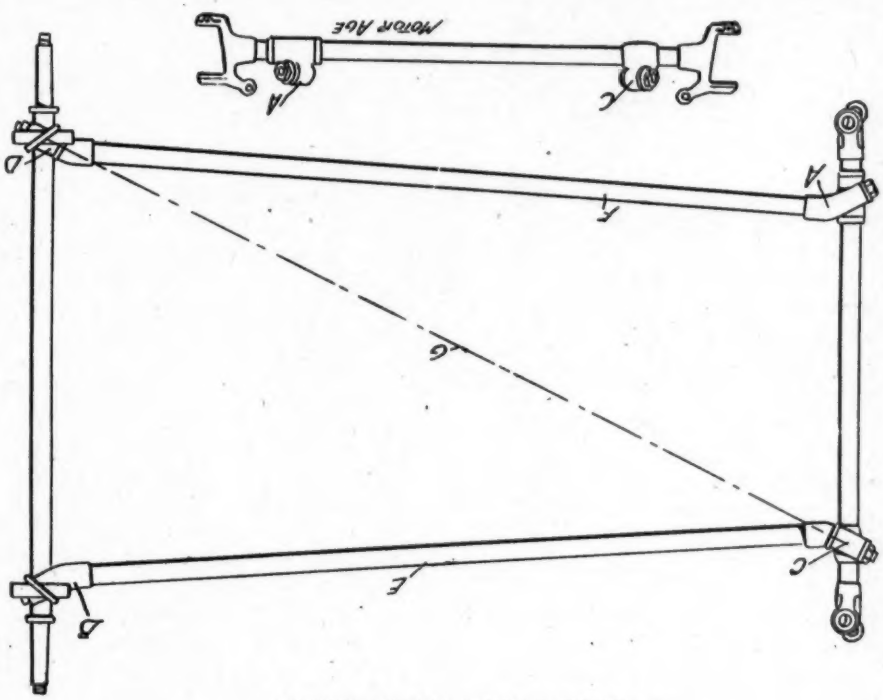
In the majority of motor-vehicle running gears constructed so that the wheels may accommodate themselves readily to uneven surfaces, the hinge between the front and rear axle-trees is located on the longitudinal center line. This patent provides a diagonal hinge which is incorporated in an extremely simple frame construction.

The frame comprises four members, the front and rear axles and two longitudinal reaches. The couplings A and B, respectively between the axles and reaches, are rigid and are comprised of sockets within which the extremities of the frame members are securely bolted or otherwise fastened. If desired, the axles may be left free to turn within their sockets, this point being optional according to the character of the vehicle.

Each of the diagonally disposed couplings C and D is provided with a socket similar to the reach sockets of couplings A and B, with the exception that the respective ends of the reaches E and F are loosely mounted therein. The axes of these sockets are in the

same diagonal line with relation to the entire frame. This diagonal line G divides the frame into two opposite parts, each comprising one transverse and one longitudinal member, which have a free hinge or folding movement upon each other and thus permit easy wheel compensation for irregular roadways.

The inventor points out that not only does the overlapping of the longitudinal and transverse members make it possible to use a very simple coupling, but that by arranging the diagonally-hinged joints at the points of intersection there is no tendency to twist the connection of the members of the frame at the other corners and no interference with the freedom of the frame to fold or hinge on the diagonal line as the inequalities of the surface upon which the wheels rest may require, and further that the employment of longitudinal members or reaches which are straight from joint to joint makes it possible to dispense with cross members or corner braces which otherwise might have to be inserted in order to receive unbalanced strains due to bending of the reaches.



MAXIM'S HINGED VEHICLE FRAME.

LIBBY AGAIN BREAKS LOOSE

Letters Patent No. 657,124, dated September 4, 1900, to Hosea W. Libby, Boston. Automobile a la water-wheel. Six claims allowed.

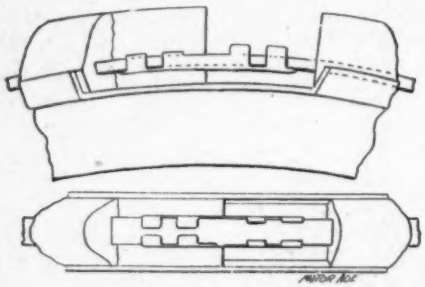
Mr. Libby bobs to view now and then with some pattern of motor vehicle which is supposed to be driven by compressed or liquefied air or similar medium, said power producer to be "squirted" from a nozzle against veins of a water-wheel contrivance on the driving axle or upon one or more of the driving wheels. His latest caricature upon mechanical invention, and the subject of this invention, is a vehicle of the surrey type.

TIRE FASTENING BAND

Letters patent No. 657,495, dated September 4, 1900, to William H. Mitchell, Boston, assignor of one-half to Dudley

H. Bradlee, Jr., Medford, Mass. Vehicle tire. Two claims allowed.

This patent relates to a solid rubber vehicle tire of the type which fits within



Mitchell's Tire Fastening Device.

a channeled rim and is held in place by a band, the ends of which are drawn together after the tire is in position. In this instance the ends of the fastening strip are secured together by means of an underlying plate having a plurality of upward projections which engage and extend through registering notches in the extremities of the fastening strip.

The strip is, of course, imbedded in the tire and when the latter is placed on the rim the ends are pushed back away from each other and the locking plate inserted with its ears projecting upward through the notches in the strip. The ears are then bent downward to rivet them and prevent displacement. To further prevent the ends of the fastening strip from working loose by lateral movement the middle portion of the locking plate, which is somewhat wider than the end portions, is bent upward at each edge alongside of the fastening strip. The upper of the two views in the accompanying illustration shows a longitudinal section of the tire in which the locking ears at one end of the plate have been turned over or riveted, while those at the other are still upright. The lower view presents a cut-away plan view of the tire and fastener.

THE EASTMAN STEAM RUNABOUT

The Eastman Automobile Co. of Cleveland are among the firms that will exhibit at the Chicago Inter Ocean tournament. Their vehicle, of which the accompanying is an illustration, is propelled by steam. The company have the following to say concerning it:

"Our running gear has a fifty-six-inch gauge—standard—which is very desirable, especially for touring. Flexible frame joints, ball bearing steering gear, solid drop forged joints and connections (no castings), twenty-eight-inch wheels with large ball bearings both in front and in the rear, are features of our running gear. The front and rear wheels are interchangeable, a very desirable feature, inasmuch as the tires of the rear wheels wear faster than those in front.

"We equip our vehicles with two Solar acetylene lamps, a mirror on the dash to reflect the water glass and an electric light near the water glass, so that it can be seen without difficulty at all times. The burner is provided with a pilot light which will keep the water hot and ready for immediate use.

"We have adopted steam in most cases as our motive power because of its simplicity and reliability. The engine is vertical, with two cylinders 2½ inches in diameter, which, running at 450 revolutions per minute, will give about five horsepower. The valves are operated by link motion, enabling the operator to adjust the cut-off, reverse the engine completely and take any speed desired up to thirty-five miles per hour.

"The water reservoir, extending around the rear of the boiler, holds twenty gallons; the gasolene tank five gallons, or sufficient for fifty miles of travel over ordinary roads. The gaso-

lene, air and muffler tanks are of seamless steel construction. The boiler shells are seamless, and the heads are part of the shell. There are no seams or rivets near the fire. There is but one seam, and this acts as an expansion joint, as the tubes in all internally-fired boilers is used there is very little, if any, visible exhaust. Dry steam means great economy.

"We equip all our vehicles with our metallic body. This body is noiseless and practically indestructible, being lined with asbestos plates, and will not

EASTMAN STEAM RUNABOUT.

expand before the outer shell. This expansion joint takes care of the difference in expansion between the tubes and the shell, and also strengthens the boiler. The dry plate between the flanges prevents foaming, and also acts as a superheater. This is very desirable on steam carriages, for, when superheated steam burn, warp, or blister. The Japan finish is baked on at 400 degrees Fahrenheit, which makes it impossible to burn or blister from any heat that might come in contact with the body. Our panels to body are detachable, making it very convenient for refinishing in a different color at any time."

GAS ENGINE WITH A THROTTLE

The Wood-Gleeson Motor Carriage Co., 106 Sudbury St., Boston, has produced a 1-horse-power working model of the gasolene engine for which letters patent were recently issued to E. C. Wood of the company, and which is distinctive because of means whereby the force of the applied power (the explosion) is governed similarly to the way in which the applied power of a steam engine is governed by a throttle.

Briefly described, the engine is furnished with an explosion chamber distinct and separate from the cylinder and a valve to regulate the force of the explosion upon the cylinder; it being possible to cut off all or any part of the power of the explosion at will. The accompanying illustration presents sections of the motor.

A transverse partition A divides the cylinder casting into a piston chamber and an explosion and compression chamber above the cylinder. The partition A is centrally apertured and its edges constitute a seat for an upwardly opening check-valve B, whose stem C is guided in a bearing carried by the cross-arms of a skeleton partition or grating D, placed crosswise of the combustion chamber. The piston chamber and explosion and compression chamber are connected by a by-pass E, formed in the cylinder casting and entering the piston chamber by a part F near the upper end of that chamber.

The gasolene vapor is admitted through a pipe G into a chamber H, which communicates with the by-pass E. The passage between this chamber and the by-pass is controlled by an inwardly opening check-valve J, whose stem is surrounded by an outwardly acting spring. Provisions for admitting air to the chamber H to be mixed with the hydrocarbon vapor are made, consisting of a port or inlet K, opening from the atmosphere into the chamber H and controlled by a plug-valve L. A plug-valve M in the by-pass E controls the passage of fluid through the by-pass to the explosion chamber.

Exhaust of the exploded charge from the cylinder is effected through a port, connecting the compression and explosion chamber with a valve-chamber N, in which a valve operates. Below this valve is an exhaust-outlet P. The stem of the valve is surrounded by a valve-closing spring and is connected at its lower end with a rod, adapted to reciprocate in a guide on the side of the cylinder. At the lower end of this rod is a roll, adapted to be engaged by a cam Q, attached to a gear, mounted on a stud. The teeth of the gear mesh with those of a second gear, attached to the end of the motor crank-shaft. The diameter of the shaft gear is half that of the gear cam, so that the latter rotates once during two rotations of the crank-shaft, and the exhaust-valve is opened once for every two complete strokes of the piston.

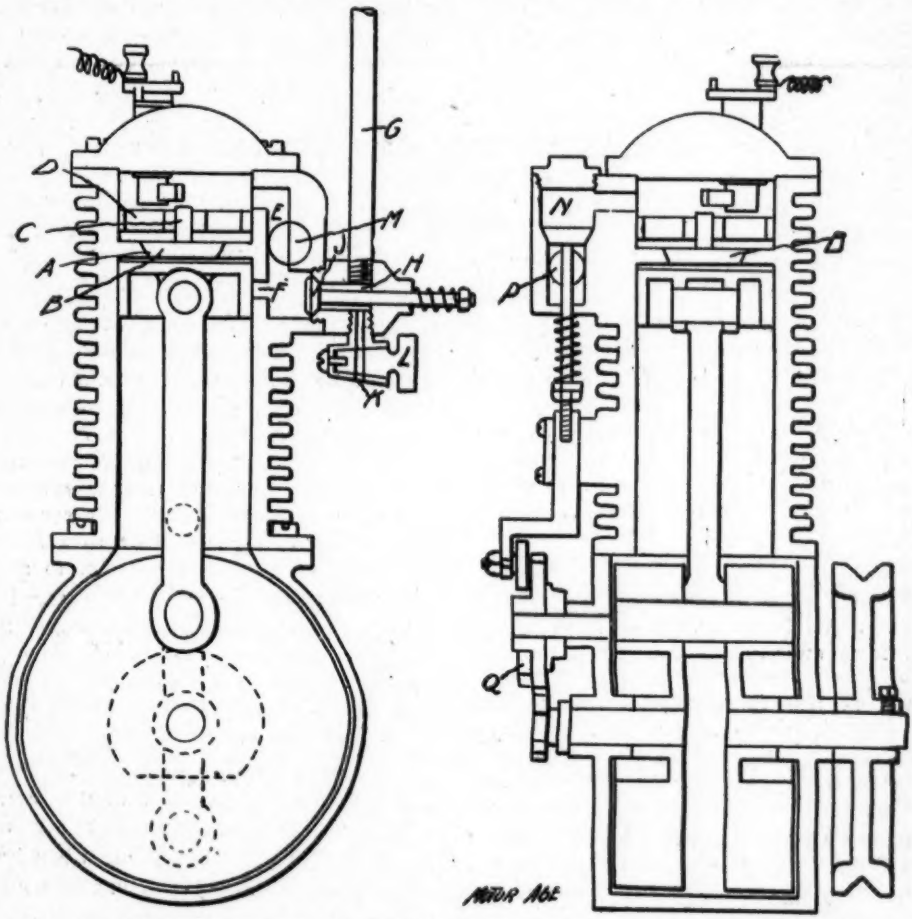
For igniting the actuating charge any suitable form of igniter may be employed.

The operation is as follows: The cycle of the engine is to first draw an explosive mixture of gas and air into the piston chamber upon the forward stroke of the piston, then to compress this charge upon the next backward stroke of the piston and force it into the compression and explosion chamber, then to ignite the charge as the piston moves forward again, whereby the actual impulse is given to the piston, and then upon the next backward stroke of the piston to exhaust the exploded charge. Assuming the exhaust to have just taken place and the piston to be at the extremity of its rearward or upward stroke, its next forward movement will create a vacuum in the piston chamber and a charge of mixed gas and air will be drawn past the check-valve J and through the port F into the piston chamber behind the piston. Upon the upward stroke of the piston this charge is forced through the by-pass E and past the check-valve B into the upper chamber. The parts will then have reached the position represented in the figures of the illustration. It will be noted that the piston covers the port F when at the ex-

tremity of its rearward stroke. The charge is exploded after the piston has started on its forward stroke and just at the instant before the port is covered. The main shock of the explosion is therefore borne by the walls of the cylinder. The port F is then immediately uncovered and the expanding exploded charge enters the piston chamber and propels the piston forward to the end of its stroke. The next rearward stroke of the piston is an exhausting stroke and during the same the products of combustion are forced through the by-pass E and past the valve M into the combustion chamber, and from thence they are liberated by the action of the outlet valve through the exhaust P. The next succeeding forward stroke of the piston commences another cycle.

By manipulating the throttle valve M the size of the opening through the by-pass may be regulated, thereby varying the force of the explosion on the piston and hence regulating the speed of the engine. By throttling the explosion the speed is easily varied.

By this method of construction of a motor the point of ignition does not require changing. The explosion taking place in a separate chamber and the power of explosion being applied to the piston by a throttle valve some of the shock and jar which occurs in the ordinary gas engine is eliminated. It is stated that no heat is required in the carburetor to assist vaporization and on account of the practically complete combustion which takes place at each explosion the odor developed is much reduced.



SECTIONAL VIEWS OF WOOD-GLEASON THROTTLE GAS ENGINE.

PHILADELPHIA AUTO DOINGS

Philadelphia, Sept. 10.—With characteristic foresight, the board of managers of the Century Wheelmen, the crack cycling organization of the country, decided at its last meeting to open wide its arms to the rapidly-growing automobile element in its ranks, and will at once inaugurate changes in its immense wheel room which, when completed, will provide accommodations for the storage of at least twenty machines. Not only are the Century officials thus providing for the comfort of their own chauffeurs, who already number nine, but, on the completion of the contemplated improvements, will receive as members such number of automobilists as the at present limited accommodations will provide for. It is then the intention to secure additional quarters near by, when the board hopes to be in a position to accept the applications of all those automobilists desiring storage facilities for their machines in addition to the creature comforts supplied by one of the most progressive wheeling and social organizations in the city.

It is understood that these changes were not decided upon until the directors had thoroughly canvassed the situation, and the avidity with which unattached automobilists affixed their names to a contingent membership list warranted the board in not only taking immediate steps to alter the wheel room, but in appointing a sub-committee to look into the matter of securing accommodations for the number over and above the score of machines for which quarters can be furnished in the wheel room.

Believe in Publicity

Those at the head of the newly organized Pennsylvania Automobile Club are evidently firm believers in the efficacy of printers' ink. Ever since the organiaztion of the club the general public has been kept in touch with its doings through the hustling activity of a secretary who would make a good press agent for a pugilist. He gets from a "stickful" to half a column in the morning and afternoon dailies three or four times a week. Especially in the campaign for a "wide open" park for automobiles is the new club's secretary doing great work. Almost daily automobile news of a general or local interest appears in the papers; indeed, it is coming so fast that quite a number of them now have an "automobiling" department on the sporting page, where all the happenings of interest in the horseless carriage field are detailed at length.

How to Train Horses

Captain Gans of the Pennsylvania Automobile Club, who is an enthusiastic horseman, told all Philadelphia, through the medium of last Thursday afternoon's Call, how he thoroughly accustomed his horses to the presence of his auto in their stable. His equines were compelled to eat their oats from the machine, and it is needless to say that they now scarce flick an ear in the "choo-choo" direction when it meanders out of the stable door. The captain's horses are, however, getting very fat—a possible explanation of their obliviousness.

A Puzzling Question

Vice-President Haugwitz of the new club gives the park commissioners a poser in Wednesday's Inquirer when he asks, "Why, in view of the fact that none of the horses used on the park driveways were stabled therein, and had to use the city streets to get there, should equines be more afraid of autos in the park than they would when meeting them while en route to that popular pleasure ground?"

Ladies' Champions

In a recent trip to Atlantic City "Bob" McCurdy won an impromptu race from Egg Harbor to Absecom, going the fourteen miles at a 2:05 gait and beating out

the "bunch" by a trifle less than five minutes. "Bob" manages the local Mobile agency, and informs the Motor Age correspondent that in behalf of a New York society lady who manipulates one of his company's machines he has accepted a challenge from Theodore Heilbron, the noted Brooklyn yachting engineer, in behalf of his 17-year-old daughter, for a race from Philadelphia to Atlantic City.

Fast Time From Atlantic City

J. Muckle, a noted Philadelphia automobilist, recently covered the sixty-two miles from Atlantic City to the Broad Street auto station in 3 hours and 8 minutes, including fernage and all stops. His mount was a Winton.

During August 530 automobiles entered Fairmount Park. Bicycles to the number of 40,037 entered during the same period, as compared with 51,961 in the same month last year.

NOTES FROM GERMANY

Berlin, Aug. 27.—The following is a solemn fact, although most people will not give credence to it and will treat it is a joke. Autumobilists are charged ten marks ($2.50) a week for water to wash themselves with! Oberhof in Thuringia is the spot which has covered itself with glory in instituting this charge, which is presumably unrivaled in its utter impudence. A wag recommends all chaffeurs compelled to pass through Oberhof to have an extra large water cooler attached to their motors in order to supply themselves with the necessary fluid, as water seems to be a costly luxury in Oberhof. And this in the first year of the new century, by grace of the German emperor.

The Mid-European Motor-Car Association has called it annual general meeting for the end of September in Dresden.

A Saxon automobile club has been formed with its center in Dresden. It will probably join the German Automobile Association very shortly. The yearly fee for members is 100 marks.

Herr Schmal, the Austrian editor en route for Paris in an autocar, has reached Luneville without having experienced any mishaps whatever.

An interesting trial spin was made in the surroundings of Hildescheim a few days ago in order to ascertain whether the driving of motor vehicles on the highways would interfere with the traffic. Three motor cars started from Hildesheim with Patteusen as their destination, the following gentlemen taking part: The chief president of Hanover, Count Stolberg, the police president of Hanover, several members of the high council, members of the Hanover ian government and gentlemen of the county council. They were all extremely satisfied with the result of the trip, as no interference with ordinary traffic on the country roads was discernible.

New automobile regulations fall due in Munich, September 1, in accordance with which twelve kilometers an hour is to be considered the maximum speed, while each driver of an automobile has to be examined as to his perfect knowledge of steering and has to carry a permit, and the vehicle must bear a number plate. Numerous streets have been closed to automobiles. Bavaria is constantly drawing up new sets of rules till the poor chauffeur grows completely confused between the regulations in vogue yesterday, but annulled to-day, and those of the present moment which will probably give way to others in the near future.

ESSEX COUNTY CLUB

The Essex County Automobile Club was organized Wednesday evening, September 5, at the residence of Kirk Brown, 79 Mountain Avenue, Montclair, N. J. Glen Ridge, Montclair, Newark, and the Oranges are represented in the membership, which promises soon to include most of the ninety or one hundred automobilists in the country.

Mr. Brown is the general manager of the Dunlop Tire Co. and has been an enthusiastic chauffeur since the birth of the new locomotion. He has used his motor-vehicle for more than a year as a transport between his residence at

Montclair and the Dunlop factory at Belleville.

TOURNAMENT IN BELGIUM

Paris, Aug. 31.—About the only item of interest in the automobile world—that is, this section of the automobile world, for we have come to learn that we are no longer the whole automobile world—was the road racing at Spa, in Belgium. The meet was of three days' duration, the first of which was devoted to a tour from Brussels to Spa. This was anything but enjoyable, coming, as it did, on a stormy day. The rain came down in torrents and the roads were deep in mud and slippery to a frightful degree. There were numerous accidents, the most serious of which befell two of the competitors who had entered for the races of the succeeding day. The Baron de Caters dropped headlong into the car of Orban-Viot, and both racing cars were badly damaged and the occupants all injured, more or less. The baron was unable to compete the next day on account of the injuries to himself and his car.

Another disagreeable feature was the effect of the mud on the racing machines, most of which were on the tour. The new thirty-horsepower car of Jenatzy was so completely choked with mud—especially the chains and carbureter—that it was impossible to use it in the races.

The second day was devoted to a race to Bastogne and return—a distance of about 250 kilometers—for regular racing machines. Hugeut led for almost the entire distance and would have been an easy winner had he not suffered a breakdown within a few kilometers of the finish. The results of the event were as follows:

Order	Horsepower.	Time.
1. Roland	8	4:25
2. Hugeut	16	4:42
3. Dewandre . ..!.....	12	4:54
5. Saleta-Ricord	6	5:35

The other contestants straggled in at long intervals, owing to various accidents.

The third day was devoted to a race over a course of 105 kilometers for voiturettes. They were divided into two classes, those of not more than 400 kilograms in weight and having not more than four horsepower, and those of greater weight and power. In the first class Madoux won in 4:03:46, Von Marcke was second in 4:23:44, and Vervier third in 4:25:02. Hautvast won in the class for heavier voiturettes in 3:20:17, Orban was second in 3:23:52, and Hermann third in 3:47:24. There were a number of accidents during the running of this event. Conrad broke his steering gear and was forced to quit, while Comte Villegast broke something not so easily repaired, viz., his classic nose, in a collision with the wagon of a peasant. His mechanician was also badly injured.

The fourth day was given over to an eighty-kilometer event for tricycles, which, however, proved uninteresting, as all but one of the contestants met with accidents to their racing machines. The fortunate who escaped was Baron Pierre de Crawhez, who won in 1:59:01. Deprez, the next man in, was nearly an hour and a half behind.

DIDN'T KNOW A HORSELESS CARRIAGE

New York, Sept. 10.—Amusing incidents of the public ignorance of the automobile are of daily occurrence at the Winton booth in the rotunda of the Equitable Building.

"Say, how does that differ from the horseless carriages that I read about? Is it one of them, or is it better than a horseless carriage?" were the queries a Motor Age representative overheard one day.

Another day a visitor wished to know whether the lever socket was to hold an umbrella.

BREAKS PACED RECORDS

Paris, Aug. 28.—Bauge has broken the ten-mile paced bicycle records from one mile up to ten. He made an attempt, paced by the giant Bertan on his tricycle, on the ten-mile record, and succeeded in breaking not only that, but all intermediate records from two miles

up, as well as all kilometer records. He then went out for the one-kilometer record and succeeded in covering the distance in 52 seconds.

TO BIG RUNS TO TRENTON

New York, Sept. 10.—The first big event this autumn in automobile club life will be the great runs to Trenton on Saturday, the 22nd. The Automobile Club of America will probably make its start from the Waldorf-Astoria at nine o'clock. The Philadelphia Automobile Club will start from the Bellevue.

President Chamberlin of the Automobile Club of America is spending the week in the White Mountains.

NEWS OF THE MOTOR INDUSTRY

AN AUSTRALIAN ASKS QUESTIONS

I. Phizackerley of 379 George Street, Sydney, Australia, writes:

"I will be pleased to have your opinion, through the medium of your paper, of a light runabout that I am thinking of building for my own use and with a view to getting into the business. I intend to build a running gear similar to that shown on page 358, Vol. I, No. 18, of The Motor Age, and to mount on the springs in front two De Dion 2¼-horsepower motors (air cooled), the motors to run in opposite directions, coupled with friction clutches in such a way that one or both can be disconnected. In such an arrangement I will have plenty of power for our bad roads and very steep hills, and will not have to hunt for water, which is a great consideration in our dry country."

The idea is all right until it comes to the method of coupling the motors. The method that the correspondent contemplates will not work well, because the explosive impulses of the two motors may come simultaneously, or one so close after the other that the vibration will be excessive. If the two motors are used, they should be rigidly attached to a common shaft, and should run with one idle stroke following each power stroke. A single motor of 4 or 4½-horsepower would undoubtedly work better than two separate motors coupled together. The difficulty of getting water can be overcome by using water-cooling tubes. Twenty feet of half-inch copper tube, with copper disks of two-inch diameter soldered on at intervals of a quarter of an inch apart, will so cool the water that two gallons will last for 100 miles or more. The copper tube can be obtained at any good supply house and the disks can be punched out at any well equipped machine shop. The job of soldering on the disks is a tedious one, but the trouble will be well repaid. The reason for using copper is that it radiates the heat far faster than any other metal. The tubes should be placed in rows near the front of the vehicle and the water kept in circulation by a small pump actuated by the engine. A rotary acting pump is preferable.

HOLMES TO MAKE AUTOMOBILES

One by one the veterans of the cycle trade forsake the old love for the new and go over to the manufacture or sale of automobiles. James S. Holmes, Jr., once vice-president of the Waltham Company and since that time manager of the bicycle sales department of the Remington Arms Co., is the latest. He has been offered and has accepted the general management of the Remington Automobile & Motor Co., one of the companies lately organized. Its location has not been decided upon, but there is little doubt Ilion, the town practically owned by the Remington interests, will be its

home. Mr. Holmes has been an able man in the cycle trade, is popular in his community and among the big buyers and looks forward confidently to success in his new line.

PHILADELPHIA TRADE

Philadelphia, Sept. 10.—Messrs Wright and Wharton are making a huge success of their "automobile station" on North Broad Street. The entire space available for storage purposes has been disposed of.

Henry Liscomb Weyer, from the establishment of the Mobile Company of America at Worcester, Mass., is the first "professional" automobilist to put in an appearance here. He has been detailed to assist Manager McCurdy in operating the local Mobile agency at Juniper and Filbert Streets, opposite City hall.

THE NEW "AUTOLIGHTS"

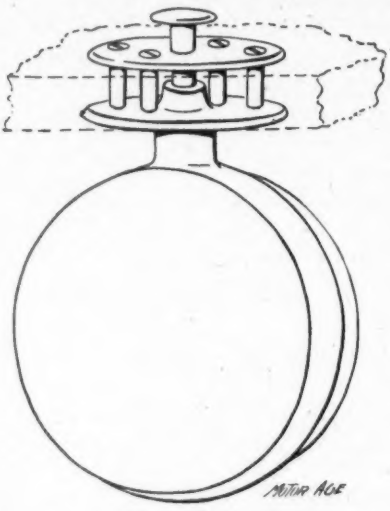
New York, Sept. 10.—Mr. Baldwin has completed his improvements on the Funke acetylene gas automobile lamps, better known as the "Autolight." The new pattern will be comletely enclosed in glass. The side-light lamps will have five-inch reflectors and the headlights eight-inch. Experiments with the new lamps in comparison with the most brilliant acetylene gas bicycle lamps show a marvelous advance in brilliancy.

CONSOLIDATION OF TWO COMPANIES

The Smith Motor Co. of Newark, N. J., makers of the Smith motors, and the Carroll Mfg. Co. of Philadelphia, makers of the Carroll chainless bicycle, have combined and organized a stock company with $50,000 capital and will be known hereafter as the Oxford Mfg. Co., and will make bicycles, motors and parts, motocycles, tricycles and automobiles, with factory at Oxford, Chester county, Pa. All communications should be addressed to the main office, 931 Chestnut Street, Philadelphia, Pa.

THE LIBERTY AUTOBELL

The Liberty Bell Co. of Bristol, Conn., is bringing out a new bell for automobiles which it calls the Autobell and which is herewith illustrated. It is an electric chime bell operated by foot pres sure. Both gongs revolve, serving the purpose of a balance wheel, and as they are attached to a loose axle or arbor



instead of being rigidly held, the best possible results are obtained. Secured to the axle are two hammers which strike the gongs alternately. As no set screws are necessary to hold the gongs in place, the appearance of the bell is not disfigured thereby. It is said to be easy to operate, compact, durable, neat in appearance and musical in tone.

LOCOMOBILE GEST MEDAL AT PARIS

New York, Sept. 10.—Word has just been received at the offices of the Locomobile Co. of America that its vehicles at the exposition on August 18 were awarded a bronze medal for superior workmanship and a gold medal for mechanical improvements.

At the Saratoga floral parade were three notably beautifully decorated Locomobiles exhibited respectively by the company and Dr. J. C. Miner.

TRADE NOTES

The Ayres Gasolene Engine & Automobile Co. of Detroit is reported to have secured a site at the foot of North Ham-

ilton Street, in that city, where the construction of a factory will soon be begun.

It is reported that the Wilhelm Bicycle Works of Harrisburg, Pa., will be utilized for building motor-vehicles.

The Pacific Motor Co. of Oakland, Cal., has been incorporated for $100,000 to manufacture and deal in motor-vehicles.

The executive offices of the Electric Vehicle Co. have been removed to the factory at Hartford, Conn., since the complete absorption of the Columbia & Electric Vehicle Co. of the latter city.

The Hampden Automobile & Launch Co. of Springfield, Mass., has been incorporated under the laws of Maine with an authorized capital stock of $100,000. J. Frank Duryea, the well-known automobile inventor, is named as president and treasurer.

A. G. Powell, one of the oldest bicycle dealers in Philadelphia, has made a contract to handle the goods of the Keystone Motor Co.

"We must keep posted, and know of but one sure way to do it—by carefully reading The Motor Age."—Wisconsin Wheel Works, Racine, Wis.

The Capital City Automobile Co. of Washington, D. C., has been incorporated with a capital stock of $100,000, to manufacture and deal in motor-vehicles.

The plant of the defunct Worcester (Mass.) Cycle Co. has been ordered sold at public auction by Judge Townsend. The plant will probably be bought in by the New York Motor-Vehicle Co.

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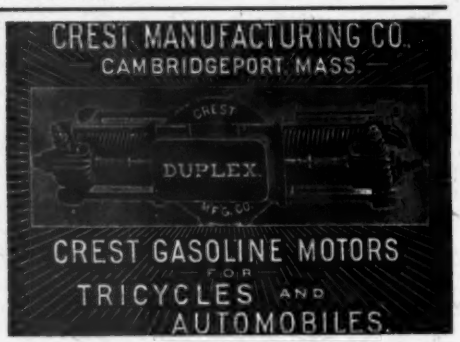

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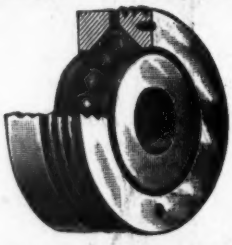

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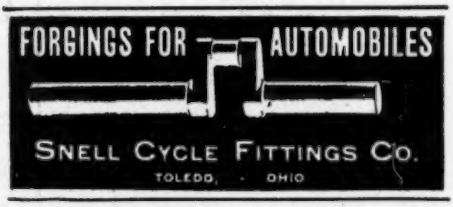

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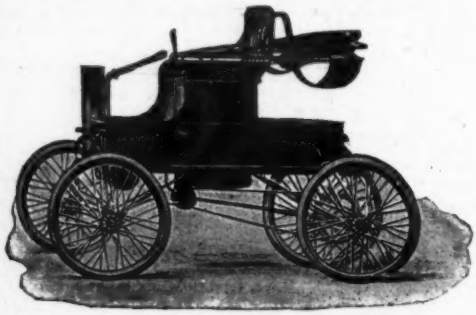

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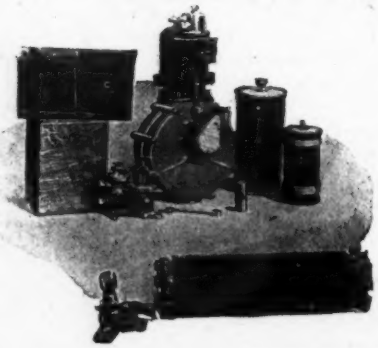

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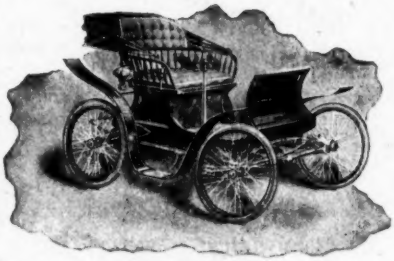

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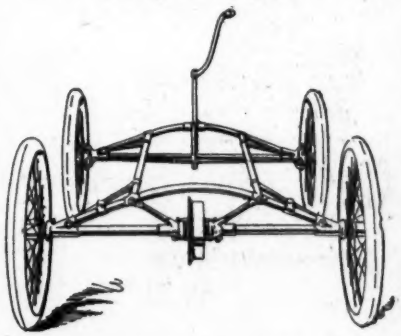

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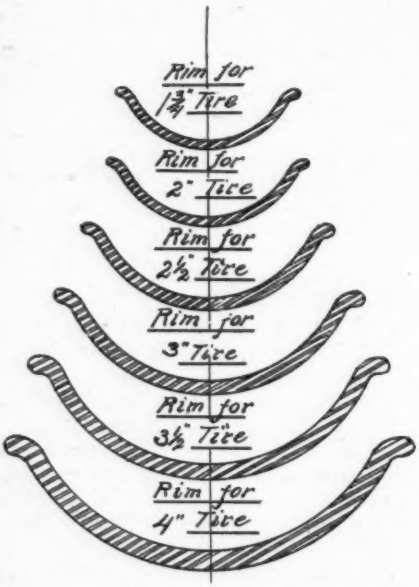

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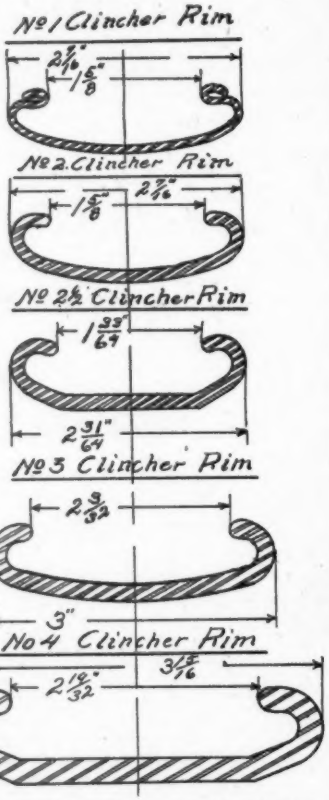

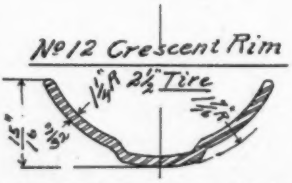

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